NATURE BASED SOLUTIONS CASE STUDY

Green Roofs *on* Fairmount Line Bus Shelters

PROJECT SUMMARY

In the summer of 2014, three bus shelters along the Fairmount/Indigo Commuter Rail line, near Talbot Station, were retro-fitted with green roofs. The roofs help to improve air quality and sequester carbon, capture rainwater, and provide cooler temperatures to combat urban heat islands. In addition to the ecological benefits, the project also trained and employed local youth through YouthBuild Boston and the TNT Eco-Teens Programs. Funding supported the project for a two year period, however, Trevor Smith (ReEarth) believes there is huge potential with this and similar projects in the future.

Along with ecological and climate benefits, this project provided green job training for local youth.

LOCATION
Dorchester, MA

CLIMATE HAZARD ADDRESSED
- Change in precipitation
- Rising temperatures

ACTIONS/TECHNIQUES
- Green Roofs

CO BENEFITS
- Community engagement
- Equity engagement
- Job opportunities and training
- Habitat creation

PROJECT STATUS
(as of Feb. 2021)
The roofs were up for two years, 2014–2016. Pilot program has ended.

SCALE/SIZE
Site; Each green roof covered 60-80 sq. feet. 14 roofs installed for total of 980 sq. feet

COSTS
$5000 per shelter

FUNDING
Land Escapes Design Inc. and Green Living Technologies International donated $15,000 in materials and labor for the project

PROJECT PARTNERS
Fairmount-Indigo Line CDC Collaborative, the Talbot Norfolk Triangle Eco Innovation District, and Land Escapes Design Inc., YouthBuild Boston and the TNT Eco-Teens Program

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Nature-Based Solutions Spectrum

Nature-based solutions use natural systems or mimic natural processes to address natural hazards and climate impacts like flooding, erosion, drought, and heat islands.

Nature-based solutions cross many scales, and include conservation of existing existing natural areas such as forests or wetlands of forests; restoration of destroyed or degraded ecosystems; and incorporating nature into the built environment.

CONSERVE EXISTING NATURAL AREAS

RESTORE OR ENHANCE ECOSYSTEMS

INCREASE NATURAL ELEMENTS IN THE BUILT ENVIRONMENT

MASS ECAN
Massachusetts Ecosystem Climate Adaptation Network

BSLA
Boston Society of Landscape Architects
The Massachusetts and Maine Chapter of the American Society of Landscape Architects

The Nature Conservancy

SNEP
Southeast New England Program

Before installation could happen, the bus shelters were inspected to make sure they had the structural capacity to be able to carry the weight of the green roofs. The bus shelter roofs were then retrofitted with hardware to accommodate the green roofs. The edging and sedum mats used were purchased from a woman-owned business, and all laborers involved in installation and maintenance were paid a living wage. The 4" green roof mat was overseeded with a house-made, drought tolerant meadow mix.

To monitor the effectiveness of the project, the team used thermal imaging cameras that recorded the temperature on the roads and sidewalks compared to the roofs. They also collected stormwater runoff from the roads and the roofs into water bottles to compare clarity and cleanliness. The differences between the roadway and sidewalk conditions to the roof conditions were dramatic. These simple approaches made an impactful point; however Trevor Smith's advice for anyone looking to replicate a project like this is to invest more time and resources into these metrics. Having hard facts and numbers to present to the public and local decision-makers committees can help to convince that it is a worthwhile undertaking.

This project, although it was only up for a short amount of time, taught the team valuable lessons and dispelled a few myths. It was often discussed that projects like these that require periodic maintenance are doomed to fail because there is no workforce available to maintain them properly. This can easily be solved by training local youth. They are eager to gain job experience and are excited to branch into different fields that may not be currently available to them. Additionally, the notion that positive steps towards climate resiliency hinge around large scale projects isn't necessarily the only approach available. Each green roof covered 60-80 sq. feet which on its own isn't much, but if cities committed to the common practice of installing green roofs on every new bus shelter, the individual areas add up. Smith says that "we can all do small things for large impacts." One acre of green roof can divert 27,000 gallons of water from strained city sewers during a single one-inch rainfall event.*

T. Smith

The roofs help to improve air quality and carbon sequestration, reduce and filter stormwater runoff, and cool urban heat islands.

"We can all do small things for large impacts." Trevor Smith, ReEarth

REFERENCES

Fairmount Line Bus Shelter Living Roof Initiative. (2014, August 01). Retrieved February 23, 2021, from https://www.ecolandscaping.org/fairmount-line-bus-shelter-living-roof-initiative/

*Leveraging the Landscape to Manage Water. (2011, January 12). Retrieved February 23, 2021, from https://dirt.asla.org/2011/01/12/leveraging-the-landscape-to-manage-water/

ADDITIONAL RESOURCES

- **Q & A with project partner Trevor Smith**
- **Mass ECAN Nature Based Solutions Resource**
- **Municipal Vulnerability Preparedness Program Nature Based Solutions Toolkit**